

Obesity, the Economic Meltdown, and the Gut Feeling for the Foods We Choose to Eat

Kevin D. Laugero, PhD

Learning Objectives:

After reading this article, the clinician should be better able to:

1. Discuss how high levels of chronic stress may affect decisions regarding food intake.
2. Describe the model through which ingestion of high-energy comfort foods may reduce stress but contribute to obesity.
3. Cite evidence suggesting a role for stress management techniques in the management of obesity.

Non-homeostatic regulation of behaviors associated with body weight maintenance may represent a very important pathway contributing to the development of obesity and eating disorders. For example, non-homeostatic regulation of food intake, such as habitually eating more or less in response to emotional stimuli, can affect a person's dietary patterns and, therefore, potentially influence body weight. Mindful control of food intake (e.g., dieting) is another important non-homeostatic mechanism that can

significantly influence food intake and inhibit emotionally based eating. The balance between these two non-homeostatic pathways is influenced by several factors, including the stress-related hormone cortisol. Chronic elevations in cortisol appear to shift the balance toward emotionally based regulation of food intake.¹ An example of where this might occur is in people who self-medicate with food ("comfort food") to reduce stress.

STRESS AND OBESITY: AN EMERGING PARADIGM

Although many different approaches to weight loss have been shown to produce results over the short term, the challenge that we continue to face is how to motivate lifelong dietary change. Before proceeding with the standard guidance of "eat right and exercise," practitioners should probe a bit deeper into the emotional contexts that might surround patient eat-

ing habits and patterns. Not unlike smoking or drinking, overeating can take the form of a lifelong habit commonly triggered by negatively charged emotional stimuli (e.g., worry and stress) and reinforced by the positive emotional consequences of eating (e.g., temporary euphoria and reduced anxiety).

Relatively recent, but mounting, evidence suggests a body-mind connection that provides a physiologic basis for emotional or stress eating.² In this body-mind connection, energy reserves in the form of abdominal fat, which are increased with the ingestion of comfort foods, influence neuropeptides (e.g., corticotropin-releasing-factor; nor-epinephrine) responsible for the emotional (e.g., anxiety), neuroendocrine (elevated cortisol), autonomic (increased heart rate), and cognitive (decision making) responses to stress.

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As shown in Figure 1, the stress-reducing effects of ingesting comfort food may result in part from the highly obesogenic effects of eating these energy-dense foods. Overall, this work provides a physiologic basis for stress-related overeating and dietary relapse. It also sheds light on why it can be so difficult for some individuals to apply "willpower" when persistently confronted with stressful stimuli such as worries about finances or job security.

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THE LIMITS OF WILLPOWER FOR EMOTIONAL EATING

What about willpower, stress, and metabolism? Most are familiar with the age-old adage "Don't let your emotions get the best of your judgment." There is a neural basis for this,³ and it turns out that if you are experiencing persistent stress, increased motivation to behave in ways that ensure emotional well-being override cognitive, mindful control of behaviors like eating. Additionally, chronic stress may impair thoughtful decision-making,⁴ and this deficit may increase reflexive types of behavior (e.g., comfort eating) that serve to ensure emotional coping. Furthermore and often underappreciated, when food intake is limited or suppressed, psychological stress mobilizes endogenous energy stores by stimulating breakdown of fat and muscle and release of energy (amino acids; fatty acids) for use by the brain and body. When stress is chronic, these catabolic effects can persist, depleting energy stores/resources. However, eating energy-dense foods prevents these catabolic processes, which in turn, probably through the body-mind pathway described in the sidebar on page 3 diminishes stress activation.

It may be the minimizing of energy loss during or after a bout of stress that influences stress pathways and mediates the stress-reducing effects of eating. In some people, cognitive processes related to how we make decisions (e.g., whether to eat more cake or make an indulgent purchase) may be influenced by emotionally relevant events that are tied to shifts in body metabolism. Differences in the way people respond emotionally and cognitively to stressful stimuli are thus potentially linked to a net balance between the degree and type

of catabolic effects of stress and the anabolic effects of eating. A greater understanding of these differences among individuals may result in new and more specific access points with which to prevent and treat obesity.

IMPLICATIONS FOR PRACTICE

Traditionally, methods for changing dietary patterns have employed a "top-down" approach emphasizing the importance of conscious decision-making on food intake. However, in light of the described metabolic-brain axis, the amount and type of foods we choose to eat may be significantly influenced by "gut feelings." Restricting access to foods that reduce feelings of stress may compromise well being and the ability to cope with anxiety, particularly in those who habitually use food to deal with everyday stress. Moreover, if alternative stress coping strategies are not recognized and utilized, mindful control of eating in those who typically use food to



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Stress and “Comfort Food”: An Emerging Model for Obesity

Figure 1 demonstrates a possible physiologic basis for emotional eating and dietary relapse in obesity. In this model energy reserves (e.g., abdominal fat) provide important input to brain systems (e.g., corticotropin-releasing-factor [CRF]; norepinephrine [NE]) that control activity in the autonomic nervous system, hypothalamic-pituitary-adrenal axis (HPA), and brain regions that mediate emotionality and higher decision-making processes.

Stress in this model is catabolic, and when it becomes chronic, as in the center illustration, it produces a reduction in energy reserves. This leads to disinhibition of the metabolic-brain feedback system (signified by the thin dotted line between energy reserves and brain in this illustration), which causes enhanced activity in CRF and NE. In turn, greater activity in these neurotransmitter systems can lead to exaggerated autonomic, HPA, and emotional (anxiety) changes typical of individuals experiencing repeated episodes of stress.

Intake of high-energy “comfort foods,” as shown in the right-hand illustration, may modify the effects of chronic stress in some people. Intake of these foods prevents significant energy loss, maintains greater activity in the metabolic-brain feedback system, and damps or switches off

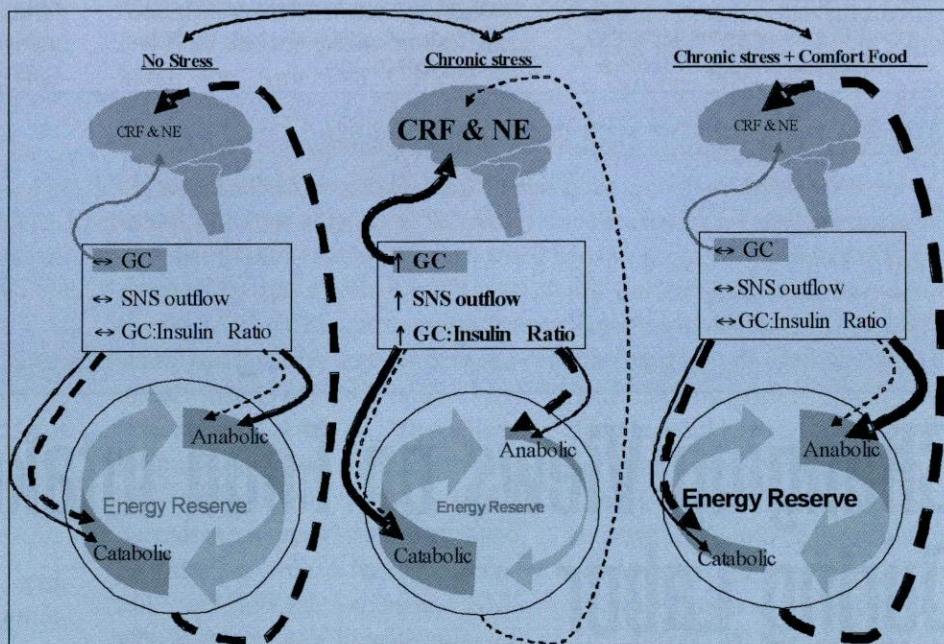


Figure 1. Possible physiologic basis for emotional eating and dietary relapse in obesity. Solid lines are stimulatory; dashed lines are inhibitory. \leftrightarrow , Normal; \uparrow , elevated; SNS, sympathetic nervous system. Reprinted with permission from Laugero K. Filling in the gaps of chronic psychological stress disease models: what's metabolic profiling have to do with it? *Endocrinology*. 2008;149:2712-2713. Copyright 2008, The Endocrine Society.

the stress response (signified by the thick dotted line between energy reserves and brain). Moreover, the combination of increased glucocorticoid (GC) output plus palatable food ingestion amplifies storage of calories into abdominal fat. Alternatively, dieting and significant body fat loss would be expected to reduce activity in the metabolic-brain feedback pathway, possibly explaining why psychological stress increases vulnerability to dietary relapse and weight regain.

cope with stress may be more susceptible to emotionally based eating.

Since most dietary guidance for management of body weight includes the restriction of typical energy-dense comfort food types, this restrictive process in and of itself can be stressful and lead to a vicious cycle of weight loss and regain. For many, to achieve durable changes in eating behavior, a combination of traditional cognitive behavioral therapy and alternative

methods of stress reduction such as “mindfulness-based stress reduction”⁵ should be considered.

Due to the recent economic crisis, the number of people now facing the stress of economic hardship is on the rise. Through the mechanisms described above, this can be expected to inhibit the efficacy of obesity treatments and perpetuate and compound the health and economic burdens of obesity. The first step toward

mitigating these effects is to understand the physiologic basis for stress's impact on non-homeostatic eating. We also need to begin equipping people, especially children, with a toolbox of stress coping strategies that will help them adopt and adhere to nutritional guidance. This is particularly true for individuals who use or will possibly learn to use obesogenic foods to cope with stress.

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Thank you for your participation in the CE program this year and best wishes for your continued success!

Changing Views on Food Intake During Labor

Kevin Lomangino, Editor, *Clinical Nutrition Insight*

Learning Objective:

After reading this article, the participant should be better able to describe the evidence (or lack thereof) supporting restrictions on solid food intake during labor.

Last year, the American College of Obstetricians and Gynecologists (ACOG) made news when it announced that “women in labor may be allowed to quench their thirst with more than just the standard allowance of ice chips.”¹ Permission to drink clear liquids was billed as a significant liberalization of the dietary restrictions often imposed on laboring women. But the authors of a new Cochrane review and meta-analysis suggest that ACOG didn't relax the rules enough. They say that an evidence-based approach would lift the ban on solid foods during labor as well.

Mr. Lomangino has disclosed that he has no significant relationships with or financial interests in any commercial organizations pertaining to this educational activity.

“The evidence identified no benefits or harms associated with restricting women's access to fluids and foods during labour for women at low risk of potentially requiring a general anaesthetic,” concluded Dr. Mandisa Singata, of the East London Hospital Complex, East London, South Africa, and colleagues.² “Hence, women should have the autonomy and freedom to choose whether to eat or drink in labour, or not.”

Restriction of foods and liquids is designed to prevent potentially fatal anesthesia-related aspiration in women who end up needing a cesarean section. However, as Geraldine O'Sullivan, MD, and colleagues pointed out in a 2008 trial of restricted food intake during labor, deaths from aspiration have become quite rare thanks in part to the increased use of regional anesthesia and new techniques to protect the airway during general anesthesia.³ They

added that prolonged fasting in labor has never been proved to influence the incidence of pulmonary aspiration, and that preventing food intake might have adverse effects such as slowing down the progress of labor.

LOOKING BEYOND ASPIRATION

Considering the rarity of anesthesia-related events during labor, Singata and colleagues reasoned that aspiration risk wasn't the only—or even the most important—endpoint for studies of food intake during labor. Instead, they looked for studies that might show benefits of food or fluid restriction on maternal and fetal birth outcomes.

They found five randomized controlled studies, involving 3130 women, which assessed the effects of food and fluid restriction during labor compared with more liberal dietary guidance. One study assessed outcomes among women who